

THE RUBIACEAE OF CERRO JEFE, PANAMA

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Cerro Jefe is a low mountain located in the Province of Panama in the Republic of Panama. It lies immediately northwest of Tocumen Airport and is about thirteen miles south of Goofy Lake. It favors the Pacific side of the Continental Divide and rises to only 2900 or 3000 ft elevation. It is easily accessible on foot. During the rainy season it is dangerous to drive there except in a heavy traction vehicle. Its summit is mist swept or rain swept throughout most of the year. The trees rarely exceed twenty five feet in height with Clusia dominating the upper story. The dominant phanerogams appear to be species of Bromeliaceae, Rubiaceae, and Melastomaceae.

Paul Allen in 1946 made several collections on Cerro Jefe; two of these I have seen: Terminalia amazonica (Gmel.) Exell (#3436) and Clethra lanata M. & G. (#3437). Within the last three years the summit has been visited by a number of botanists, especially by Edwin Tyson, Kurt Blum, Robert Godfrey, J. Duke, and J. Dwyer.

The following is a list of the species of Rubiaceae collected thus far on the summit of Cerro Jefe; numbered among these are the new species described in this paper. Recent collections on Cerro Jefe on March 12, 1967 by J. Dwyer, G. Gauger, and K. Baker should yield additional new species of Rubiaceae. Herbarium material is deposited in the Missouri Botanical Garden and in the U.S. Army Tropic Test Center, Miraflores Annex, Canal Zone.

Borreria laevis (Lam.) Griseb.
Cephaelis elata Sw.
Cephaelis tomentosa Aubl.
Chiococca alba (L.) Hitch.
Coccocypselum glabrum DC.
Dukea panamensis Dwyer
Faramea jefensis Dwyer & Hayden
Faramea loftonii Dwyer & Hayden
Faramea papillata Dwyer & Hayden
Genipa vulcanicola Standley
Geophila herbaceum (Jacq.) Schum.
Hillia tetrandra Sesse & Moc.
Isertia hypoleuca Benth.
Ixora floribunda (Rich.) Griseb.
Ladenburgia sp.

Palicourea guianensis Aubl.
Palicourea tysonii Dwyer & Hayden
Psychotria capitata R. & P.
Psychotria erecta (Aubl.) Standley & Steyermark
Psychotria luxurians Rusby
Psychotria pithecolobium Standley
Psychotria racemosa (Aubl.) Willd.
Psychotria suerrensii D. Sm.
Rondeletia salicifolia Dwyer & Hayden
Sabicea villosa R. & S.

Below are the new species found on the summit of Cerro Jefe together with taxa representing noteworthy range extensions into or within Panama.

1. *CHIONE BUXIFOLIA* Dwyer & Hayden, sp. nov.

Frutex ad 3 m altus, omnino glaber, ramulis teretibus laevibus ultime rimosis. Folia stipulis ad 4 mm longis, lamina elliptica vel rhombico-elliptica, 2-4 cm longa, 1.5-2.8 cm lata, apice obtuso-acuta vel rotundo-obtusa, basi cuneata, coriacea supra plus fusca nitido-laeve, costa supra plana subtus prominula, venis lateralibus 4 bene ascendentibus subtus evanescentibus in sicco supra depressis, marginibus conspicue revolutis. Inflorescentiae breves, ad 2.5 cm longae, ca 2.5 cm latae, pedunculo ad 1.3 cm longo, ramulis primariis ternate dispositis, ad 1 cm longis, pedicellis (hic in fructu) ad 0.5 cm longis. Flores non visi. Fructus elliptici, ad 1.5 cm longi, 0.75 cm lati, in sicco nigri apice obtusi, lobulis calycis 4 persistentibus minutis, ad 1 mm longis, vel nullis, seminibus solitariis durissimis magnis, endopermo biporoso (sect. trans.).

PANAMA: Cerro Jefe, 2700-3000 ft elev, Tyson, Dwyer & Blum 3291 (MO, Holotype).

The stony drupaceous fruit whose endosperm is biporous in cross-section readily distinguishes this as a Chione, a genus which is limited to a few species in Mexico and Central America. The nearest relatives geographically are: Chione panamensis Steyermark from Cerro Horqueta, Prov. Chiriqui, Panama. It occurs at a much higher altitude (6500 ft) and has much larger leaves with the secondary veins more numerous and prominent beneath. Chione guatemalensis Standley & Steyermark has extraordinary large leaves borne on elongate petioles.

2. *FARAMEA JEFENSIS* Dwyer & Hayden, sp. nov.

Frutex ad 7 m altus, ramulis fortiter arcuato-ascendentibus in sicco nigris, nodis dilatatis minute ciliolatis. Folia stipulis elongato-cylindricis omnino amplexicaulis, 2.5 cm longis, vagina apice acuta minute puberula, petiolis ad 0.8 cm longis; lamina anguste elliptica, 9-15 cm longa, 2-4.5 cm lata, apice longe cuspidata, cuspidate ad 1.5 cm longa, ca 1.5 cm lata, basi cuneata, saepe inaequalateralis, coriacea laevis glabrescens, venis lateralibus ca 20, vix arcuatis subtus gracili-prominulis, vena marginale irregulari-undulata a margine ca 3 mm distante, marginibus vix crassis. Inflorescentiae contracto-cymoso-paniculatae, ad 2.5 cm longae, ad 3 cm latae, pedunculo vix deficiente, carnosae, ca 3 mm lato, ramis ascendentibus, bracteis foliaceis ovatis, 2-4 cm longis, 1-2 cm latis, apice longe cuspidato, cuspidate ad 0.8 cm longo, glabris, variegatis in laminae medio albis, marginibus viridibus, eis omnino basin inflorescentiae tegentibus. Flores pallide azurei, pedicellis ad 3 mm longis, hypanthio calyceque ad 6 mm longo, glabro; calyx cupulatus, ad 1.5 mm longus et ca 2 mm latus, dentibus 4, minutis; corolla apice in gemmis clavata, tubo cylindrico, 9-12 mm longo, lobis 4, triangularibus (trans. sect.), ad 8 mm longis, crassis; antherae 4, 3.5-4 mm longae, infra medium tubi affixae; ovarium septo integro, parte superiore deficiente, ovulis 2, suborbicularibus, in parte connatis, stylo ca 8 mm longo, stigmatibus linearibus, ca 2 mm longis, erectis minute papillatis. Fructus non visi.

PANAMA: Cerro Jefe: 2700-3000 ft alt, Tyson, Dwyer & Blum 3396 (MO, Holotype); Dwyer, Gauger & Baker 7279 (MO).

K. Schuman (in Engl. & Prantl, Pflanzenfam. (4) 135. 1891) divided Faramea into 4 sections: Homocladus Muell.-Arg., Hypochasma Muell.-Arg., Tetramerium DC., and Eufaramea Muell.-Arg. Only sect. Hypochasma has the stipules connate, the sheath being small and being truncate or with minute awns. The stipules of F. jefensis would seem to favor this section, except that they are not small but measure up to 2.5 cm in length. Thus it would seem appropriate to describe a new section for the genus Faramea: Section Grandistipulata (Sectio Grandistipulata Dwyer & Hayden, sect. nov.: stipulae magnae connatae; bracteeae magnae foliaceae.

3. *FARAMEA LOFTONII* Dwyer & Hayden, sp. nov.

Frutex, ramulis quadrangularibus laevibus glabris. Folia stipulis triangularibus, ad 4 mm longis, basi connatis, coriaceis

petiolis 0.3-0.5 cm longis, glabris, anguste alatis; lamina falcato-angusto-elliptica, 10-12 cm longa, 3-4 cm lata, apice acuta, ultime vix acuminata vel conspicue acuminata, acumine ad 0.7 cm longo, rare falcate disposito, basi acuta, papyracea, supra glabra, venis lateralibus 10-12, laxe arcuatis prominulis, venis intermediis grandibus irregularibus, multis areolis patulis, reticulatis. Inflorescentiae terminales, ad 4 cm longae, ad 4 cm latae, cymoso-paniculatae, pedunculo ad 2 cm longo, 0.15 cm lato, glabro, ramis 3-4 divergentibus vel ascendentibus, ad 1.2 cm longis, cymulis terminalibus 3-6 flores ferentibus, bracteis inferioribus rare persistentibus lineari-ellipticis, ad 15 mm longis, ca 1.5 mm latis, rigidis glabris venosis. Flores albi, pedicellis 1.5-3 mm longis, glabris; hypanthium ca 0.5 mm longum; calyx urceolatus, ca 1.3 mm longus, truncatus, dentibus evanescentibus; corolla tubo cylindrico, ca 10 mm longo, lobis 4 crassis, 5-6 mm longis; antherae oblongae, ca 4 mm longae, obtusae, filamentis proxime medium tubi affixis; ovarium septo basi loculi disposito atque gracili, ovulis 2, dorsaliter contiguis (long. sect.), stylo 11-12 mm longo, stigmatibus nigris marcescentibus papillatis. Fructus non visi.

PANAMA: Cerro Jefe, 2700-3000 ft alt, Tyson, Dwyer & Blum 3323 (MO, Holotype)

The new species resembles F. talamancarum Standley known from Bocas del Toro, Panama and adjacent Costa Rica. It differs in having thinner leaves which are not ovate in shape or conspicuously caudate at the apex. The flowers of the new species are white, while they are blue in F. talamancarum.

The species is named in honor of Dr. Horace Loftin of Florida State University who has contributed much to the biology of Panama and was one of the first scientists to recognize the biological richness of the summit of Cerro Jefe.

14. FARAMEA PAPPILLATA Dwyer & Hayden, sp. nov.

Frutex ad 3 m altus, omnino glaber, ramulis subplano-compressis. Folia stipulis basi connatis, dimorphis vel parvis compresso-rotundis, apice elongato-cuspidatis, cuspidate ad 0.25 cm longa, vel ellipticis, ad 0.7 cm longis, acuminatis, cicatricibus stipularum conspicuis, ad 0.4 cm longis, petiolis 1-1.5 cm longis; lamina elliptica, 12-14.5 cm longa, 5.5-7.5 cm lata, apice rotundata ultime obtusa, coriacea nitida in sicco bullata vel papillata bicolor, costa subtus prominente, venis lateralibus 10-12 arcuatis, vena marginale conspicua irregulari-undulata, a margine ca 5 mm distante, areolis subtus prominentibus. Inflorescentiae terminales umbelliformi-paniculatae, ad 5.5 cm

longae, ad 6 cm latae, pedunculo laeve, ad 1.6 cm longo, ca 0.3 cm lato, ramis primariis 4 aequalibus rigide forteque ascendentibus, ramis terminalibus ternate dispositis, aequalibus, ca 1 cm longis, floribus in utroque ramulo ternate dispositis. Flores hypanthio urceolato, ad 3 mm longo, in sicco nigro; calyx coronarius, ca 1 mm longus (in fructu immaturo ad 4 mm longo) brunneus, margine undulato, dentibus evanescentibus; petala staminaque non visa; ovarium ovulis 2, semiorbicularibus contiguis, septo evanescente. Fructus (hic immaturi) subrotundi, ad 0.5 cm longi, in sicco nigri laeves glabri.

PANAMA: Cerro Jefe, 2700-3000 ft elev, Tyson, Dwyer & Blum 3284 (MO, Holotype); Tyson, Dwyer & Blum 3381 (MO)

The new species is probably assignable to Section Tetramerium of Faranea as the calyx (in the flowering stage) is small, the stipules are aristate and the cymules are non fasciate. The ternately disposed branches of F. papillata are striking.

Faranea bullata Standley, based on a collection by G.P. Cooper (#509) from Bocas del Toro, Panama, and also known from Colombia (Cuatrecasas 16997) has leaves which are similarly bullate. The leaves, however, are much more elongate than in the new species and are markedly 3-plinerved.

5. GENIPA VULCANICOLA Standley, Field Mus. Publ. Bot. 17: 213. 1917.

PANAMA: Cerro Jefe: Duke 8026 (MO); Tyson 3397 (MO); Tyson, Dwyer & Blum 4441 (MO)

This is the first report of the species in Panama. It was described from Guatemala.

6. HILLIA TETRANDRA Sesse & Moc., Fl. Mex. ed 2. 84. 1893.

PANAMA: Coclé: Cerro Valle Chiquito, 700-800 ft elev, Seibert 495 (MO); Panama: E slope Cerro Jefe, 2700 ft elev, Tyson 3436 (MO)

7. RONDELETIA SALICIFOLIA Dwyer & Hayden, sp. nov.

Frutex ramulis glabris. Folia stipulis triangularibus, 2-3 mm longis, integris persistentibus, subsessilia; lamina anguste elliptica, 7.5-10 cm longa, ad 4 cm lata, elongato-acuminata, acumine ad 1.5 cm longo, saepe falcate disposito, basi acuta, membranacea, supra glabra subtus in venis minute pubescens, venis lateralibus 5-6 supra evanescentibus subtus prominulis, areolis

reticulatis. Inflorescentiae terminales cymoso-pyramidato-paniculatae ca 1.5 cm longae, ca 1.5 cm latae, pedunculo pubescente, 2-2.5 cm longo, ramulis ternate dispositis, bracteis bracteolisque conspicue petaloideis, bracteis lineari-ellipticis, ad 7 mm longis, bracteolis crebre circum flores dispositis, Flores albi; hypanthium ellipticum, ca 1.5 mm longum, pubescens; calyx lobis 4, 2-3 in longitudine aequalibus, uno vel duobus petaloideis, lobis minoribus linearibus, ca 3 mm longis, maioribus ovatis, ad 7 mm longis, apice late acutis, pubescentibus venosis; corolla tubo cylindrico, ca 3 mm longo (hic immaturo), apice conspicue clavato, basi intus minutissime pubescentibus, lobis forte imbricatis suborbicularibus, hic quam tubo brevioribus, ca 1 mm longis; antherae 4 sessiles lineares, in medio tubi affixae; ovarium biloculare, septo crasso, placentis axillaribus, ovulis numerosissimis planis suborbicularibus, stigmatibus linearibus, hic tubo aequalibus, vix reflexis. Fructus non visi.

PANAMA: Cerro Jefe, 2700-3000 ft elev, Tyson, Dwyer & Blum 3319 (MO, Holotype)

Superficially the crowded expanded bracteoles which envelop the cymules resemble those of Cephaelis. Presumably there are two bracteoles per flower. The striking inequality in length of the calycine lobes is unique for the Central American species of Rondeletia. On boiling, the inflorescence yields a red pigment.

8. SCHRADERA BLUMII Dwyer & Hayden, sp. nov.

Frutex scandens, ramulis quadrangularibus laevibus glabris rimosis. Folia stipulis caducis, cicatricibus stipularum conspicuis, ca 1 mm longis, nodis 2-5 cm distantibus, petiolis 1.5-2.5 cm longis, rigidis glabris; lamina angusto-oblonga, saepe falcato-oblonga, 7-10 cm longa, 3-4 cm lata, apice acuta vix acuminata, basi acuta et plerumque paullo inaequilaterale carnosocoriacea glabra venis lateralibus rigide ascendentibus, supra evanescentibus subtus prominulis, areolis patulo-reticulatis, marginibus leviter revolutis. Inflorescentiae terminales in sicco nigrae, ad 4.5 cm longae, pedunculo ad 2 cm longo, ca 0.25 cm lato, floribus in unum globosum cymuloso-capitulum aggregatis, bracteis in sicco nigris, in cupulum ca 2.5 cm latum conjunctis, marginibus undulatis. Flores hypanthio oblongo-rotundo (hic in fructu immaturo), ad 10 mm longo, glabro; calyx cylindrico-urceolatus, ad 8 mm longus, truncatus, dentibus deficientibus, ovario biloculato, septo medio, placentis axillaribus. Fructus non vidimus praeter semina immatura, eis multis planis elongatis ellipticis, 1-1.3 mm longis, obtusis, testa minute favosa.

PANAMA: Cerro Jefe, 2700-3000 ft elev, Tyson, Dwyer & Blum 3218 (MO, Holotype)

This is the first report of this little known genus north of South America. The species is named in honor of Mr. Kurt Blum who has collected herbarium material on Cerro Jefe on several occasions.

9. *PSYCHOTRIA LUXURIANS* Rusby, Mem. Torrey Bot. Club 6: 50. 1896.

PANAMA: NE slope Cerro Jefe on road to Buenos Aires, 2600 ft elev, Tyson, Dwyer & Blum 3255 (MO); E slope Cerro Jefe, Tyson 3429 (MO); summit Cerro Jefe, Dwyer, Gauger & Baker 7298 (MO).

Psychotria luxurians has been collected in only two Provinces of Panama, Darien and Panama. Presumably Panama represents the most northern range of the species. The Darien collection was made by M.E. Terry & R.A. Terry (#1524) on the Cana-Guasi Trail at 4000 ft elev. The only other collection in the Province of Panama was made by Sister M. Victoria Hayden on Cerro Campana (#119). The species has been reported from Peru and Ecuador (Standley, Field Mus. Nat. Hist. Bot. 7: 307. 1931) and is known from several collections by Bang and Buchtien in Bolivia.